

A NEW NEARCTIC SPECIES OF *LESTODIPLOSIS*
(DIPTERA: CECIDOMYIIDAE) PREYING ON AN OAK LEAF TIER,
PSILOCORISIS QUERCICELLA (LEPIDOPTERA: OECOPHORIDAE)

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Abstract.—A new species of cecidomyiid, *Lestodiplosis venusta* Gagné, is described, illustrated, and compared to its most similar congeners. Larvae of the new species were found in Missouri preying on caterpillars of *Psilocorsis quercicella* Clemens, a leaf skeletonizer of oaks. An unidentified species of Ceraphronidae was reared from pupae of the *Lestodiplosis*.

Key Words: *Lestodiplosis*, predator, oak leaf tier

A new species of *Lestodiplosis* attacking larvae of the oecophorid *Psilocorsis quercicella* Clemens was discovered by one of us (JTL) during the course of an ecological study of the natural enemies of the lepidopteran in Missouri. *Psilocorsis quercicella* is a common bivoltine moth found throughout eastern United States (Covell 1984). The larvae skeletonize the surface of oak leaves within leaf shelters formed by tying together adjacent oak leaves with silk. Larvae of the gall midge predator appear to be highly mobile ectoparasites of early instar *P. quercicella* larvae and are often gregarious. When present, one to four of the predaceous cecidomyiids were found per caterpillar. The predator was found feeding on *P. quercicella* on both white oak (*Quercus alba* L.) and black oak (*Q. velutina* Lam.). After feeding, full grown *Lestodiplosis* larvae spin a silken cocoon within the leaf shelter, often incorporating pieces of caterpillar frass onto the surface of the cocoons. To date, larvae of the predator have been observed only from second generation *P.*

quercicella larvae collected in late summer and fall in Missouri. An unidentified gregarious parasitoid (Hymenoptera: Ceraphronidae) has been reared from the *Lestodiplosis* pupae.

The genus *Lestodiplosis* contains some 175 known species in the world that attack many kinds of insects and mites. Some appear to be specialist predators, others are evidently generalists. Many species are known from only one or a few specimens so it is especially helpful to have several series of the same species from a particular niche, such as JTL found in leaf ties of *P. quercicella*.

METHODS

Larvae of the predator were reared to the adult stage in 16-oz. closed clear plastic containers kept at 23°C and with a photoperiod of 14:10 (L:D) h. Humidity was maintained with moist filter paper. Specimens of immature stages and reared adults were preserved in 70% isopropyl alcohol. Specimens were mounted on microscope

slides using the method outlined in Gagné (1989). Terminology for adult morphology follows usage in McAlpine et al. (1981) and for larval morphology that in Gagné (1989).

***Lestodiplosis venusta* Gagné,
new species
(Figs. 1–13)**

Adult.—**Head:** Eyes connate, 11–12 facets long at vertex; facets hexagonal, all closely adjacent. Occiput with dorsal protuberance. Frons with 10–14 setae. Labella hemispherical but pointed apically, each with several lateral setae. Palpus 4-segmented. Male antennal flagellomeres (Fig. 1) binodal; basal node and the distal third of the neck dark; one circumfilum on the basal node, two on the distal, the loops of the three circumfila unequal in length; the proximal and distal circumfila with ventralmost loops greatly elongated and much longer than remaining loops. Female flagellomeres (Fig. 2) with basal part of node and distal part of neck darker than remainder of flagellomere; circumfila with some short loops.

Thorax: Wing (Fig. 3) 1.8–2.3 mm long, R_5 slightly curved, joining C posterior to wing apex; 7–8 irregular dark spots present on wing. Legs (Fig. 4) with alternating light and dark groups of scales. Tarsal claws (Fig. 5) untoothed, curved beyond mid-length; empodia attaining bend in claws.

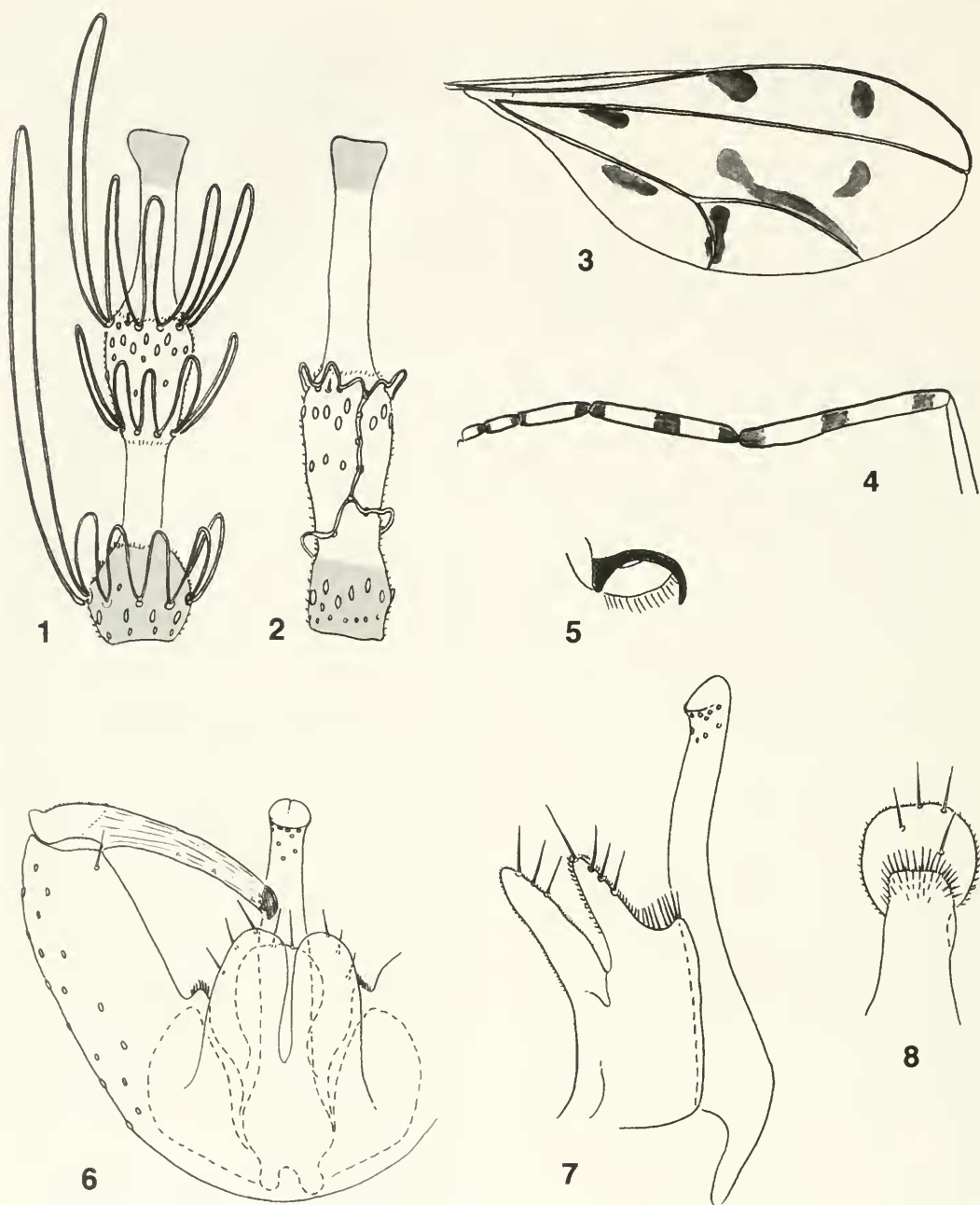
Male abdomen: First through seventh tergites entire, rectangular, with single posterior row of setae, several lateral setae, scattered scales, and 2 anterior trichoid sensilla; eighth tergite undifferentiated, the only vestiture the anterior pair of trichoid sensilla. First through seventh sternites quadrate, with single to double posterior row of setae, scattered setae elsewhere, no scales, and 2 anterior trichoid sensilla; eighth sternite similar to preceding except weakly sclerotized anterolaterally. Genitalia (Figs. 6–8): cerci each with rounded posterior margin; hypoproct simple, rounded at apex, as long as but slightly wider in ventral view than cerci, with 2 pairs of apicoventral

setae, produced anteroventrally into large lobe lying in close juxtaposition with dorsal surface of aedeagus and covered posteriorly with short spinules; aedeagus elongate with blunt apex, sinuous in side view; gonocoxite elongate cylindrical with short, triangular mesobasal lobe bearing short spinules; gonostylus elongate cylindrical, with setulae near base and covered with minute carinae and only several short setae beyond.

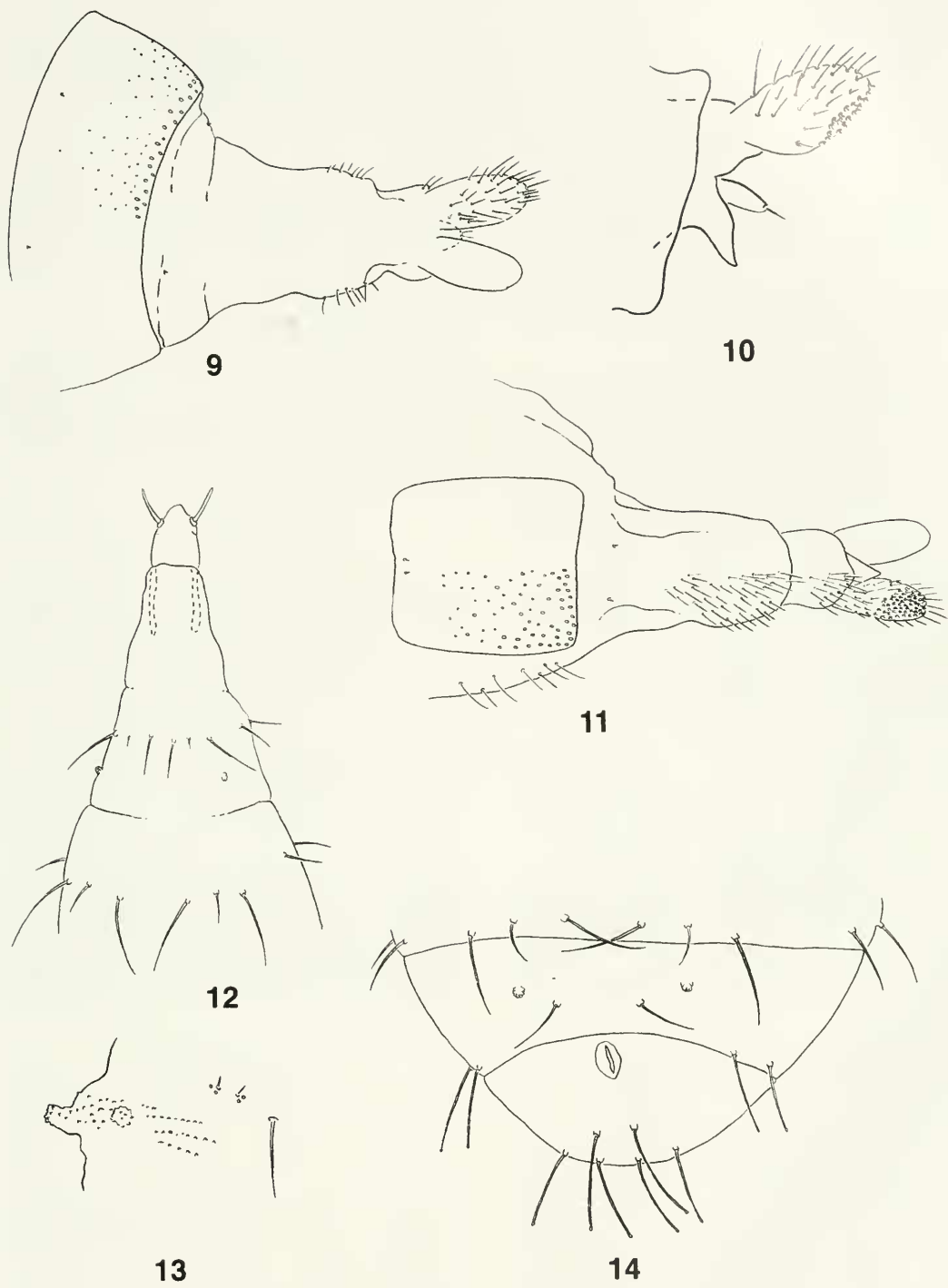
Female abdomen (Figs. 9–11): First through seventh tergites entire, rectangular, with mostly single row of posterior setae, several lateral setae, extensively covered with scales, and 2 anterior trichoid sensilla. Second through seventh sternites quadrate, extensively covered with setae and scales and with anterior pair of trichoid sensilla. Eighth segment much narrowed, without differentiated tergite and sternite, the tergum with anterior pair of trichoid sensilla the only vestiture, the sternum with anterior pair of trichoid sensilla and covered with setae some distance beyond. Tenth segment without vestiture dorsally, with scattered setae ventrally; cercus large, ovoid, with ventral field of short, closely-set, sensory setae, and scattered setae elsewhere. Hypoproct short, wide, the convex posterior edge with 2 short setae. Apex of ninth sternite protruding posteriorly below hypoproct, rigid, triangular.

Third larval instar (Figs. 12–14).—Integument mostly smooth, 2 pseudopods present ventrally on mesothorax and metathorax and 3 each on first through seventh abdominal segments. Antenna much longer than wide. Cephalic apodemes slightly longer than head capsule. Spatula absent. Lateral papillae in 2 groups of 3 on each side of central line, only one setose in each group. Second and fifth dorsal papillae of each segment much shorter than remaining four. Terminal segment with 6 elongate setae, usually with expanded apices.

Holotype.—♂, reared from larva preying on larva of *Psilocorsis quercicella* on oak, Cuivre River State Park, Troy, Missouri, 1-IX-1997, J. Lill, deposited in the National



Figs. 1-8. *Lestodiplosis venusta*. 1, Male third antennal flagellomere. 2, Female third antennal flagellomere. 3, Wing. 4, Foreleg. 5, Tarsal claw and empodium. 6, Gonopod, cerci, hypoproct, and aedeagus (dorsal). 7, Cercus, hypoproct, and aedeagus (lateral). 8, Hypoproct (ventral).



Figs. 9–14. *Lestodiplosis venusta*. 9–11, Female postabdomen. 9, Seventh tergite to cerci (not all setal bases and setae indicated; dorsal). 10, Cerci, hypoproct and apex of ninth sternum, the postabdomen retracted (lateral). 11, Seventh sternite to cerci (not all setal bases and setae indicated; ventral). 12–14, Larva. 12, Head, neck, and first two thoracic segments (dorsal). 13, part of mesothorax with two groups of three lateral papillae, a ventral papilla, and two pseudopods (ventrolateral). 14, Apex of seventh and all of eighth and terminal abdominal segments (dorsal).

Museum of Natural History (USNM), Washington, DC.

Other material examined.—All associated with leaf ties of *Psilocorsis quercicella*, Cuivre River State Park, Troy, Missouri: 6 ♂, 5 ♀, 9 larvae, same data as holotype; 6 ♂, 1 ♀, same data as holotype except collected 11-IX-1996, all in USNM.

Etymology.—The specific name, *venusta*, is an adjective meaning beautiful, with reference to the striking black and white banded legs and antenna.

Remarks.—The banded antenna and legs and the spotted wings of this species are generally similar to some other *Lestodiplosis* species, but the combination of unequal male circumfila and a blunt-tipped aedeagus is characteristic in the Nearctic Region of a narrower group of three species that differ chiefly in details of the male genitalia. These three species are: *Lestodiplosis florida* Felt, *Lestodiplosis cinctipes* (Felt), and *Lestodiplosis satiata* Felt. These other species are now under investigation by one of us (RJG) for a revision in progress of Nearctic *Lestodiplosis*.

Compared to the new species, the ventral hypoproctal lobe of *L. florida* is covered by fewer but more robust spinules and its aedeagus is much wider on the basal two-thirds and tapers abruptly to a narrow neck. *Lestodiplosis florida* was originally taken from a leaf roll on a *Crataegus* in Florida. This species is represented in the USNM collection by a specimen from Florida that was reared from galls on *Croton linearis* Jacq. and another that was swept from *Tsuga canadensis* (L.) Carr. in Ontario.

The ventral lobe of the hypoproct of both *L. cinctipes* and *L. satiata* is covered more extensively and by finer spinules than in the new species and the aedeagus in these species is narrower throughout its length than on *L. venusta*. In addition, the antennal circumfila loops of both species are all much longer than in *L. venusta*. Both species were originally caught in flight in New York, but a specimen of *L. satiata* in the USNM was

reared in association with cynipine leaf galls on *Quercus* sp. in Pennsylvania and another was reared from flower heads of *Borrichia frutescens* (L.) DC. in North Carolina.

There is one other Nearctic *Lestodiplosis* species, besides *L. venusta*, that has been recorded as feeding on caterpillars. Felt (1933) described *Lestodiplosis novangliae* Felt from specimens associated with a tortricid *Epinotia* "nanana" on spruce in Massachusetts. He noted also that larvae similar to that species were found on another tortricid, *Rhyacionia* sp. on pine. The gonocoxites of *L. novangliae*, unlike those of *L. venusta*, have prominent and spiny mesobasal lobes.

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